CLAIMS

What is claimed is:

1. A video controller for interfacing a frame buffer to a dual scan display
having adjacent first and second display portions with a display boundary therebetween,
the video controller comprising:
a raster engine adapted to receive video data from the frame buffer, to format the
video data, and to render the formatted data to the dual scan display line by line; and
a hardware cursor adapted to selectively overlay a cursor image onto at least one
of the first and second display portions.

2. The video controller of claim 1, wherein the raster engine comprises first
and second data paths respectively associated with the first and second display portions,
and wherein the hardware cursor is adapted to overlay a first portion of the cursor image
onto the first display portion and to overlay a second portion of the cursor image onto the
second display portion if the cursor crosses the display boundary.

3. The video controller of claim 2, wherein the hardware cursor is adapted to
selectively insert first portion cursor data associated with the first portion of the cursor
image into the first data path of the raster engine, and to selectively insert second portion
cursor data associated with the second portion of the cursor image into the second data
path of the raster engine if the cursor crosses the display boundary.

4. The video controller of claim 3, wherein the raster engine comprises a
vertical counter with first and second vertical counter values respectively indicating first
and second lines of formatted data being rendered to the first and second display
portions, and a horizontal counter with a horizontal counter value indicating the column
of formatted data being rendered to the display;
wherein the hardware cursor comprises a first cursor start address register with a
first cursor start address indicating a first cursor portion starting line in the first display
portion, a second cursor start address register with a second cursor start address

49

indicating a second cursor portion starting line in the second display portion, a first

10 cursor portion height register with a first cursor portion height value indicating a first cursor portion height, a second cursor portion height register with a second cursor portion height value indicating a second cursor portion height, a cursor column register with a cursor column start value, and a cursor image width register with a cursor image width value indicating a cursor image width;

15 wherein the hardware cursor comprises a cursor state machine adapted to compare the first vertical counter value with the first cursor start address and the first cursor portion height value, to compare the second vertical counter value with the second cursor start address and the second cursor portion height value, and to compare the horizontal counter value with the cursor column start value and the cursor image width

20 value; and

wherein the hardware cursor comprises a cursor line buffer adapted to selectively insert first portion cursor data associated with the first portion of the cursor image into the first data path of the raster engine according to the comparison of the first vertical counter value with the first cursor start address and the first cursor portion height value

25 and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value, and to selectively insert second portion cursor data associated with the second portion of the cursor image into the second data path of the raster engine according to the comparison of the second vertical counter value with the second cursor start address and the second cursor portion height value and the

30 comparison of the horizontal counter value with the cursor column start value and the cursor image width value, if the cursor crosses the display boundary.

5. A method of overlaying a cursor image onto a dual scan display in a video controller for interfacing a frame buffer to a dual scan display having adjacent first and second display portions with a display boundary therebetween, the method comprising:

rendering video data from the frame buffer to the dual scan display using a raster

5 engine; and

selectively overlaying a cursor image onto at least one of the first and second display portions according to a cursor position using a hardware cursor.

6. The method of claim 5, further comprising determining whether the cursor image crosses the display boundary according to the cursor position.

7. The method of claim 6, further comprising:

determining first and second portions of the cursor image if the cursor image crosses the display boundary;

overlaying the first portion of the cursor image onto the first display portion if the cursor crosses the display boundary; and

overlaying the second portion of the cursor image onto the second display portion if the cursor crosses the display boundary.

8. The method of claim 7, wherein determining the first portion of the cursor image comprises:

comparing a first vertical counter value in the raster engine with a first cursor start address and a first cursor portion height value in the hardware cursor; and

comparing a horizontal counter value in the raster engine with a cursor column start value and a cursor image width value in the hardware cursor.

9. The method of claim 8, wherein determining the second portion of the cursor image comprises:

comparing a second vertical counter value in the raster engine with a second cursor start address and a second cursor portion height value in the hardware cursor; and

comparing the horizontal counter value in the raster engine with the cursor column start value and the cursor image width value in the hardware cursor.

10. The method of claim 9, wherein overlaying the first portion of the cursor image onto the first display portion comprises selectively inserting first portion cursor data associated with the first portion of the cursor image into a first data path of the raster engine according to the comparison of the first vertical counter value with the first cursor start address and the first cursor portion height value and the comparison of the

horizontal counter value with the cursor column start value and the cursor image width value.

11. The method of claim 8, wherein overlaying the first portion of the cursor image onto the first display portion comprises selectively inserting first portion cursor data associated with the first portion of the cursor image into a first data path of the raster engine according to the comparison of the first vertical counter value with the first cursor start address and the first cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

12. The method of claim 9, wherein overlaying the second portion of the cursor image onto the second display portion comprises selectively inserting second portion cursor data associated with the second portion of the cursor image into a second data path of the raster engine according to the comparison of the second vertical counter value with the second cursor start address and the second cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

13. The method of claim 10, wherein overlaying the second portion of the cursor image onto the second display portion comprises selectively inserting second portion cursor data associated with the second portion of the cursor image into a second data path of the raster engine according to the comparison of the second vertical counter value with the second cursor start address and the second cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

14. The method of claim 5, further comprising:
   determining first and second portions of the cursor image if the cursor image crosses the display boundary;

overlaying the first portion of the cursor image onto the first display portion if the

5 cursor crosses the display boundary; and

overlaying the second portion of the cursor image onto the second display portion if the cursor crosses the display boundary.

15. The method of claim 14, wherein determining the first portion of the cursor image comprises:

comparing a first vertical counter value in the raster engine with a first cursor start address and a first cursor portion height value in the hardware cursor; and

5 comparing a horizontal counter value in the raster engine with a cursor column start value and a cursor image width value in the hardware cursor.

16. The method of claim 15, wherein determining the second portion of the cursor image comprises:

comparing a second vertical counter value in the raster engine with a second cursor start address and a second cursor portion height value in the hardware cursor; and

5 comparing the horizontal counter value in the raster engine with the cursor column start value and the cursor image width value in the hardware cursor.

17. The method of claim 16, wherein overlaying the first portion of the cursor image onto the first display portion comprises selectively inserting first portion cursor data associated with the first portion of the cursor image into a first data path of the raster engine according to the comparison of the first vertical counter value with the first cursor

5 start address and the first cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

18. The method of claim 15, wherein overlaying the first portion of the cursor image onto the first display portion comprises selectively inserting first portion cursor data associated with the first portion of the cursor image into a first data path of the raster engine according to the comparison of the first vertical counter value with the first cursor

5   start address and the first cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

19.   The method of claim 16, wherein overlaying the second portion of the cursor image onto the second display portion comprises selectively inserting second portion cursor data associated with the second portion of the cursor image into a second data path of the raster engine according to the comparison of the second vertical counter

5   value with the second cursor start address and the second cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

20.   The method of claim 17, wherein overlaying the second portion of the cursor image onto the second display portion comprises selectively inserting second portion cursor data associated with the second portion of the cursor image into a second data path of the raster engine according to the comparison of the second vertical counter

5   value with the second cursor start address and the second cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

21.   A hardware cursor for overlaying a cursor image onto a dual scan display having adjacent first and second display portions with a display boundary therebetween, comprising:
        means for selectively overlaying a cursor image onto at least one of the first and

5   second display portions according to a cursor position.

22.   The hardware cursor of claim 21, further comprising means for determining whether the cursor image crosses the display boundary according to the cursor position.

23.   The hardware cursor of claim 21, further comprising:

means for determining first and second portions of the cursor image if the cursor image crosses the display boundary;

means for overlaying the first portion of the cursor image onto the first display portion if the cursor crosses the display boundary; and

means for overlaying the second portion of the cursor image onto the second display portion if the cursor crosses the display boundary.

24.   The hardware cursor of claim 23, wherein the means for determining the first portion of the cursor image comprises:

means for comparing a first vertical counter value in the raster engine with a first cursor start address and a first cursor portion height value in the hardware cursor; and

means for comparing a horizontal counter value in the raster engine with a cursor column start value and a cursor image width value in the hardware cursor.

25.   The hardware cursor of claim 24, wherein the means for determining the second portion of the cursor image comprises:

means for comparing a second vertical counter value in the raster engine with a second cursor start address and a second cursor portion height value in the hardware cursor; and

means for comparing the horizontal counter value in the raster engine with the cursor column start value and the cursor image width value in the hardware cursor.

26.   The hardware cursor of claim 25, wherein the means for overlaying the first portion of the cursor image onto the first display portion comprises means for selectively inserting first portion cursor data associated with the first portion of the cursor image into a first data path of the raster engine according to the comparison of the first vertical counter value with the first cursor start address and the first cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.

27. The hardware cursor of claim 26, wherein the means for overlaying the second portion of the cursor image onto the second display portion comprises means for selectively inserting second portion cursor data associated with the second portion of the cursor image into a second data path of the raster engine according to the comparison of the second vertical counter value with the second cursor start address and the second cursor portion height value and the comparison of the horizontal counter value with the cursor column start value and the cursor image width value.